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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,184	01/23/2002	Olivier H. Sudre	26409.00100	5284

28983 7590 09/22/2003

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EXAMINER

MCNEIL, JENNIFER C

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 09/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,184

Applicant(s)

SUDRE ET AL.

Examiner

Jennifer C. McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18-32, 34-43 is/are rejected.
- 7) ☒ Claim(s) 17 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 29 April 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☒ Other: Copy of first office action (3/3/3)

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Response to Amendment

The reply filed on July 7, 2003 is not fully responsive to the prior Office Action because of the following omission(s) or matter(s): There is no response to the rejections of Todokoro '672, Boakye '632, Merrill '370, and Shoji '780. A copy of the previous office action is attached for convenience. See 37 CFR 1.111. Since the above-mentioned reply appears to be *bona fide*, applicant is given ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this notice, whichever is longer, within which to supply the omission or correction in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is (703) 305-0553. The examiner can normally be reached on 9-6, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0611.



JCM

September 8, 2003



DEBORAH JONES

SUPERVISORY PATENT EXAMINER

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: The footnotes are objected to as informal. Applicant is encouraged to amend the specification to incorporate the footnote into the regular text.

Applicant's attention is called to the specification pages 9, line 25, page 13, lines 22 and 25, and page 14, lines 16 and 20, where Figure 1 or 2 are referenced. Should any of these references refer to 1a, 1b, 2a, or 2b?

Appropriate correction is required.

Drawings

The drawings are objected to because they are not appropriately labeled. The specification refers to Figures 1a, 1b, 2a, and 2b (see preamendment of Paper No. 4), but the figures are not labeled as such. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-16, 29-32, and 41-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13, 29, and 41 each recite the limitation "the metal substrate" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7, 8, 11, 12, 18-20, 24, 25, 28, 34, 37, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Morgan et al (US 5,665,463). Morgan teaches a ceramic composite with a bonded interface between the constituents of the ceramic composite. The bond material is chosen from monazites and xenotimes.

Regarding claims 3 and 20, Morgan teaches that monazites and xenotimes are nearly stoichiometric compounds, where the ratio of La:P is essentially 1:1 (col. 8, lines 61-64).

Regarding claims 11, 12, 28 and 40, one embodiment includes a composite (40) consisting of alumina layers alternating with LaPO₄ layers (44). It is the examiner's position that the substrate comprises a layer of alumina onto which the lanthanum phosphate is deposited.

Regarding claim 34, another embodiment teaches forming a two phase matrix of aluminum oxide and lanthanum phosphate (col. 9, lines 40-41). According to the instant specification, aluminum oxide is considered a refractory oxide (see instant specification, page 10, lines 4-5).

Regarding claims 7, 8, 24, 25, and 37, the methods by which the layers are formed do not structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or

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obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.”, *In re Thorpe*, 227 USPQ 964, 966. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product, *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP §2113.

Claims 1, 3, 5-8, 11, 12, 18, 20, 22-25, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Glassman et al (US 5,698,022). Glassman teaches a precursor composition useful for vapor deposition formation of lanthanide metal/phosphorus oxide films onto substrates.

Regarding claims 3 and 20, the precursor compounds may be employed to provide a desired stoichiometric ratio of La:P, e.g. 1:1 (col. 7, lines 5-10)

Regarding claims 12 and 28, the films are coated onto substrates such as glass, metal, or ceramics (col. 7, lines 65-67).

Regarding claims 5-8, and 22-25, the methods by which the layers are formed are not considered to structurally limit the article. “[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. However, Glassman does teach vapor deposition of precursor materials.

Claims 1-3, 5-12, 18-21, 22-28, 34, and 36-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Hunt et al (US 5,858,465). Hunt teaches chemical vapor deposition of phosphate films and coatings. Hunt teaches that phosphates are a preferred coating applied by CCVD because of the corrosion resistance and refractory properties of phosphates (col. 7, lines 35-39). The phosphates that may be deposited include monazites and xenotimes (col. 8, lines 13-37).

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Regarding claim 34, Hunt gives an embodiment where the coating comprises an inner layer of a lanthanum oxide and a layer of monazite. It is the position of the examiner that the entire coating comprises these two layers and therefore is a mixture of a rare-earth phosphate and a refractory oxide. Furthermore, the stoichiometry of the monazite is slightly off due to the lanthanum rich inner layer.

Regarding claims 3 and 20, Hunt gives an example where the product produced has a La:P ratio of 1:1.3, which is considered "about" 1:0.89 (La/P =1.13) (col. 15, lines 10-15).

Regarding claims 5-8, 22-25, 36 and 37, the substrate may be heated to 100-2200 degrees Celsius during deposition. Specifically, to form crystalline or monazite phases the temperature is 900-1300 degrees Celsius (col. 8, lines 60-64). However, these method limitations are not considered to structurally limit the final article.

Regarding claims 7, 8, 24, 25, and 37, the methods by which the layers are formed do not structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production.

Regarding claims 9, 26, and 38 one embodiment taught by Hunt includes a layer consisting of a lanthanum rich layer and a layer of columnar grained monazite (col. 15, lines 3-5).

Regarding claims 10, 27, and 39, Hunt also teaches that the porosity of the layer may be controlled in order to form less porous or more porous ceramics (col. 10, lines 15-20).

Regarding claims 12, 28, and 40, the substrate may be ceramic (col. 7, lines 35-52).

Claims 1, 7, 8, 11, 12, 18, 24, 25, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Tadokoro et al (US 6,200,672). Tadokoro teaches a surface treated metal plate. The metal plate is coated with a layer comprising a complex and/or salt between a rare earth metal element and an organic

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compound such as a phosphoric group. Table 2 gives examples of the matrix of the layer and includes lanthanum phosphate.

Regarding claims 7-8, and 24-25, the methods by which the layers are formed are not considered to structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production.

Claims 1, 2, 7, 8, 11, 12, 18, 19, 24, 25, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Boakye et al (US 5,759,632). Boakye teaches a fiber-reinforced composite having a monazite interface between the reinforcing fiber and the ceramic matrix, in which the filaments are coated with monazite (LaPO_4).

Regarding claims 7-8, and 24-25, the methods by which the layers are formed are not considered to structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production.

Regarding claims 12 and 28, the substrate is considered the filament which may comprise ceramic (col. 2, lines 3-8).

Claims 1, 7, 8, 11-13, 18, 24, 25, 28, 29, 34, 40, and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Merrill et al (US 6,235,370). Merrill teaches a high temperature erosion resistant thermal barrier composite coating. The coating comprises a metallic structure filled with ceramic hollow spheres in a phosphate bonded matrix. The ceramic matrix (4) preferably comprises at least one phosphate such as lanthanum phosphate (col. 3, lines 19-24). The hollow spheres may be alumina (refractory oxide) or the like (col. 3, lines 28-31).

Regarding claims 7, 8, 24, 25, and 37, the methods by which the layers are formed are not considered to structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production.

Regarding claims 12, 13, 28, 29, 40, and 41, the substrate (8) may comprise a nickel, cobalt, or iron superalloy (col. 3, lines 35-40).

Claims 1, 4, 7, 8, 11, 12, 18, 21, 24, 25, 28, 34, 35, 37, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Shoji et al (US 6,190,780). Shoji et al teach a surface treated metal material. The corrosion resistant layer may comprise lanthanum phosphate (col. 9, lines 35-48).

Regarding claims 4, 21, and 35, the thickness of the coating may be 5 microns (col. 9, lines 5-9).

Regarding claims 7-8, 24-25, and 37, the methods by which the layers are formed are not considered to structurally limit the article. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production.

Regarding claims 12, 28, and 40, the substrate may be metal (col. 7, lines 5-19).

Regarding claim 34, compounds such as silica and alumina may be added to the coating layer (col. 11, lines 4-10).

Allowable Subject Matter

Claims 17 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 14-16, 30-32, 42, and 43 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or render obvious a thermal barrier coating comprising a rare-earth element phosphate on a metal substrate, wherein the metal substrate is a nickel-based superalloy, an iron-based superalloy, or a cobalt based superalloy, and further comprising a layer of aluminum phosphate or alumina between the metal substrate and the rare-earth metal phosphate. The prior art of record does not teach this combination nor does it provide motivation to make this combination.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer McNeil whose telephone number is 703-305-0553. The examiner can normally be reached on Monday through Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 703-308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer McNeil
Examiner
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JCM
February 23, 2003